

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

TITLE V RENEWAL (DRAFT PERMIT) NO. V-05-082

EAST KENTUCKY POWER COOPERATIVE, INC.

JOHN SHERMAN COOPER POWER STATION

BURNSIDE, KY 42519

JUNE 6, 2006

BEN MARKIN, REVIEWER

SOURCE I.D.: 21-199-00005

SOURCE A.I. #: 3808

ACTIVITY #: APE20040002

**SOURCE DESCRIPTION:**

An application for the renewal of the Title V permit V-97-044, for the East Kentucky Power Cooperative/John Sherman Cooper Power Station was received on May 3, 2004. The renewed Title V operating permit will include the Phase II Acid Rain permit and NO<sub>x</sub> Budget permit for this source.

The John Sherman Cooper Power Station is an electric power generation plant located on Lake Cumberland, near Burnside in Pulaski County. The station consists of two coal-fired boilers (with No. 2 fuel oil for Start-up and stabilization), each supplying steam to a dedicated turbine-generator. Each boiler is a balanced-draft, dry bottom, wall-fired type, utilizing "once through" cooling water. A single-liner chimney handles the combined flue gases from the boilers. Coal is received by truck or rail. A common coal storage and handling system provides crushed coal to the bunkers. There is a common fly ash storage and conveying system bottom ash storage and handling system and a belt conveyor system that removes the bottom ash from the boilers. The bottom ash is hauled to an on-site depository. Both fly ash and bottom ash are available to be recycled and used in construction materials.

The Standard Industrial Classification (SIC) Code for electric generation is 4911. Kentucky and federal air permitting programs, 401 KAR 52 and 40 CFR 70, classify the source as "major" respectively.

There are no significant modifications to the facility for this Title V renewal.

**COMMENTS:**

(1) Emission Units: The following is a list of significant emission units at the facility:

- (a) Emission Unit 01 (EP01): Coal-fired Boiler #1, Utilizing No. 2 Fuel Oil for Start-up and Stabilization- Unit #1  
Description: Emission unit #1 is a pulverized coal-fired, dry bottom, wall fired indirect heat exchanger (boiler) that began operation on February 9, 1965, providing a net electrical output of 116 megawatts. The boiler has a design heat input rating of 1,080 mmBtu/hr. The flue gas is routed through a six-section “cold side” electrostatic precipitator to collect fly ash. The precipitator was installed in 1971, and it was rebuilt in 1989. Compliance with the sulfur dioxide emission standard is met by utilizing reduced sulfur coal. Low-NOx burners were installed in 1993.
- (b) Emission Unit 02 (EP02): Coal-fired Boiler #2, Utilizing No. 2 Fuel Oil for Start-up and Stabilization - Unit #2  
Description: Emission unit #2 is a pulverized coal-fired, dry bottom; wall fired indirect heat exchanger (boiler) that began operation on October 28, 1969, providing a net electrical output of 220 megawatts. The boiler has a design heat input rating of 2,089 mmBtu/hr. The flue gas is routed through two six-section “cold side” electrostatic precipitators to collect fly ash. The precipitators were installed in 1971, and they were rebuilt in 1989. Compliance with the sulfur dioxide emission standard is met by utilizing reduced sulfur coal. Low-NOx burners were installed in 1994.
- (c) Emission Unit 03 (EP03 and EP04): Coal-Handling Operations  
Description: The coal handling system includes truck and railcar unloading, coal receiving hoppers, a coal crusher and conveyor, coal reclaim hopper, a coal stacker, coal stockpile, haul roads and a yard area. The coal-handling operations commenced before 1970. The initial Title V Operating Permit (TVOP) considered each of these activities as EP03; however, consistent with the current KYEIS for this source, the haul roads are identified as EP04 in this renewal permit. The other coal-handling activities remain as EP03; however the original TVOP and the current KYEIS are revised to remove reference “screens”. The permittee confirmed in a September 24, 2004 letter to the Division that no such activity exists at this source. Particulate emissions from these activities are controlled using dust suppression techniques including use of water spray, chemical additives, and covered conveyors.
- (d) Emission Unit 05 (EP05 and EP06): Two Fly Ash Silos  
Description: Two fly ash silos were constructed in 1993, including a pneumatic conveying system. Particulate emissions from each silo are controlled by a fabric filter baghouse installed on each silo.

- (e) Emission Unit 06 (EP06): Fly Ash Unloading  
Description: Fly ash is unloaded from the two fly ash silos to trucks within an enclosure. Particulate emissions are controlled by water spraying the ash and the enclosure. The process has been determined by the Division in the initial TVOP review to be an insignificant activity.
  - (f) Emission Unit 07 (EP07): Coal-Crushing Facility  
Description: The coal-crushing facility (Run of Mine Coal Handling Facility) includes a feeder, a crusher feeder conveyor, a crusher, and a crushed coal conveyor and discharge chute. The coal-crushing facility was constructed in 1998. Particulate emissions from these activities are controlled through dust suppression by spraying water, using chemical additives, and covering the conveyor.
  - (g) Emission Unit 08 (EP08): Emergency Diesel Generator  
Description: This emergency generator is a CAT 3516, No. 2 diesel fuel oil-fired internal combustion engine. Construction of the generator commenced in 2003, and the generator is a new unit now incorporated into the TVOP renewal. The generator is designed at a heat input rating of 12.18 mmBtu/hr and a power output rating of 1600KW. The total hours of operation for the emergency generator are limited to 500 hours per year or less.
- (2) Refer to Section C of the Title V permit for a list of the facility's insignificant activities.
  - (3) Emission Factors: The source's potential emissions of air pollutants are calculated based on emission factors provided in the Title V permit renewal application. Emission factors for the 2 boilers were derived from stack testing for particulate emissions, continuous emission monitoring systems (CEMS) for NO<sub>x</sub> and SO<sub>2</sub>. Other emission factors were references from the U.S.EPA (AP-42 and Factor Information Retrieval (FIRE)), and the Electric Power Research Institute. AP-42 emission factors are used for particulate emissions from materials handling activities.
  - (4) Applicable Regulations:

This source is subject to the federal Phase II acid rain requirements for Emission Units 01 and 02. The federal acid rain rule requirements are codified in 40 CFR Parts 72 to 78, which are incorporated by reference in 401 KAR 52:060. The Division has issued a Phase II acid rain permit for the prevention, abatement, and control of air pollution. The two coal fired boilers have NO<sub>x</sub> limits and averaging plans set by 40 CFR Parts 75 and 76 for Phase I, Group 1 boilers, as such is defined at 40 CFR 76.2. The two boilers also have Phase II SO<sub>2</sub> allowances as listed in 40 CFR 73.10 for each year from 2000 to 2009, and 2010 and beyond. The SO<sub>2</sub> and NO<sub>x</sub> requirements are incorporated into Section J of the permit.

The two boilers are subject to 401 KAR 51:160, NOx requirements for large utility and industrial boilers, and 40 CFR 96, the NOx Budget Trading Program which is incorporated at 401 KAR 51:190. Pursuant to 401 KAR 51:160, Section (5), the permittee is required to submit to the Division an application for a NOx Budget Permit, which will include established NOx emission limits and related program requirements contained in the federal NOx SIP Call. Pursuant to 401 KAR 52:020, Section 3, the permittee shall operate in compliance with the applicable NOx Budget requirements, which are incorporated into Section K of the permit.

The two boilers are subject to 401 KAR 61:015, *Existing indirect heat exchangers*, which is applicable to existing indirect heat exchangers with a capacity of 250 mmBtu/hr or greater and commencing before August 1971. The two electrostatic precipitators (ESPs) controlling particulate matter (PM) emissions from each boiler were rebuilt in 1989. Therefore, pursuant to 401 KAR 61:015, Section 4(4), the two boilers are subject to the allowable PM emission rates of 401 KAR 61:015, Section 4(1). As such, PM from Boiler #1 and Boiler #2 each shall not exceed 0.23 lb/mmBtu actual heat input based on a three hour average. The allowable emission rate is determined in accordance with 401 KAR 61:015, Section 3(1) based on the total rated heat input capacity of the two affected facilities (i.e., 3169 mmBtu/hr). The permittee may assure continuing compliance with the PM standard by operating the affected facilities and associated control equipment such that opacity does not exceed the upper limit of the indicator range developed from COM data.

Pursuant to 401 KAR 61:015 Section 4(3), emissions from each boiler shall not exceed (40) percent opacity with respect to PM except:

- (1) That, for cyclone or pulverized fired indirect heat exchangers, a maximum of sixty (60) percent opacity shall be permissible for not more than one (1) six (6) minute period in any sixty (60) consecutive minutes;
- (2) For emissions from an indirect heat exchanger during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

To meet the monitoring requirement for particulate, the permittee shall use a continuous opacity monitor (COM).

401 KAR 61:015, Section 5(1), applies to the operating and emission limitations for sulfur dioxide (SO<sub>2</sub>). Emissions of SO<sub>2</sub> from the two boilers each shall not exceed 3.3 lb/mmBtu actual heat input, based on a 24-hour average.

In accordance with 401 KAR 61:015, Section 6 (3) the rate of each fuel burned shall be measured daily and recorded. The heating value and ash content of fuels shall be ascertained at least once per week and recorded. The average electrical output and the minimum and maximum hourly generation rate shall be measured and recorded daily.

Coal handling operations (Emission Unit 03) are subject to fugitive emissions, 401 KAR 63:010 Fugitive Emissions is applicable to each affected facility which emits or may emit fugitive emissions and is not elsewhere subject to an opacity standard within the administrative regulations of the Division for Air Quality.

Pursuant to 401 KAR 63:010, Section 3, reasonable precautions shall be taken to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, when applicable, but not be limited to the following:

1. Application and maintenance of asphalt, application of oil, water, or suitable chemicals on roads, material stockpiles, and other surfaces which can create airborne dusts;
2. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials, or the use of water sprays or other measures to suppress the dust emissions during handling;

Pursuant to 401 KAR 63:010, Section 3, discharge of visible fugitive dust emissions beyond the property line is prohibited.

The permittee shall monitor the amount of coal and limestone received and processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis. Visible emissions from each piece of equipment or operation described for this item or group shall be monitored daily during daylight hours to determine whether conditions appear to be normal or abnormal. The permittee shall maintain records of the amount of coal and limestone received and processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis.

The two fly ash silos (Emission Unit 05) are subject to 401 KAR 59:010, new process operations. The permittee may assure compliance with the particulate mass and opacity standards by assuring proper operation of the baghouses. Proper operation of the baghouses can be assured by weekly qualitative observation of stack emissions and in an event of higher opacity observation, determining the opacity of emissions by Reference Method 9 and initiating an inspection of the control equipment for any necessary repairs.

The two fly ash silos, boiler #1 and boiler #2 are subject to the requirements of 40 CFR 64, Compliance Assurance Monitoring (CAM), for each units emissions of particulate matter. The facility has submitted the requisite CAM plans for these emission units and their related control devices. The related requirements are incorporated into the renewal permit.

401 KAR 60:250 (Standards of Performance for Coal Preparation Plants), incorporating by reference 40 CFR 60 Subpart Y, is applicable to the Coal Crushing Facility (Emission Unit 07) because construction was commenced after October 24, 1974 and more than 200 tons of coal is processed per day. Proper operation of the system can be assured by qualitative weekly observations of the system, as well as Method 9 opacity observations at least once per year.

(5) Non-Applicable Regulations:

The following regulations are not applicable to emission units 01 and 02 (boiler #1 and #2) due to applicability date of the regulation, the size (capacity) of the units, or for other reasons stated below. These determinations are consistent with those made by the Division during the initial Title V Operating Permit review.

401 KAR 59:015 (New Indirect Heat Exchangers), is not applicable because the boilers commenced prior to the rule classification date of August 17, 1971.

401 KAR 59:016 (New Electric Utility Generating Units), is not applicable because the boilers commenced prior to the rule classification date of September 19, 1978.

401 KAR 60:050, Section 3(1)(b) (Standard of Performance for New Stationary Sources), incorporating by reference 40 CFR 60 Subpart D. The requirements of 40 CFR 60 Subpart D are not included in the permit because this rule is not applicable to units constructed prior to August 17, 1971, and there have been no modification or reconstruction approvals issued to the source.

401 KAR 60:050, Section 3(1)(c) (Standard of Performance for Electric Utility Steam Generating Units), incorporating by reference 40 CFR 60 Subpart Da. The requirements of 40 CFR 60 Subpart Da are not included in the permit because this rule is not applicable to units constructed prior to September 18, 1978, and there have been no modification or reconstruction approvals issued to the source.

401 KAR 60:050 Section 3(1)(d) (Standards of Performance for Industrial, Commercial, Institutional Steam Generating Units), incorporating by reference 40 CFR 60 Subpart Db. The requirements of 40 CFR 60 Subpart Db are not included in the permit because this rule applies to units that commence construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 MW (100 million Btu/hour). The two boilers commenced prior to this rule applicability date and there have been no modification or reconstruction approvals issued to the source.

401 KAR 57:002 (NESHAP), incorporating by reference 40 CFR 63 Subpart DDDDD. This regulation is not applicable because boilers that are electric utility steam generating units that are fossil fuel-fired combustion units of more than 25 megawatts that serve a generator that produces electricity for sale are exempt from this regulation. As such, boiler #1 and #2 are not subject to the requirements of this regulation.

The requirements of National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) (40 CFR 63, Subpart ZZZZ) have not been included in this permit because a new emergency stationary RICE is not subject to the requirements of this rule, pursuant to §63.6600(c) and §63.6640(e), except for the initial notification requirements of 40 CFR 63.6645(d).

The requirements of the *National Emission Standards for Hazardous Air Pollutants for*

*Halogenated Solvent Cleaning*, 40 CFR 63.460, Subpart T, are not included in the permit since the source does not operate any cleaners, as insignificant activities, using listed halogenated HAP solvents in a total concentration of greater than 5 percent by weight.

**SOURCE STATUS:**

Pulaski County is designated as attainment for the 8-hour ozone standard. Nitrogen oxides (NO<sub>x</sub>), a regulated ozone precursor pollutant, is emitted at a rate greater than 250 tons per year. Particulate matter (PM) and (PM-10), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), and hydrochloric acid (HCl), a hazardous air pollutant (HAP), are each emitted at a rate greater than 250 tons per year. As such, this existing source is a major stationary source under prevention of significant deterioration or air quality (PSD), 401 KAR 51:017. Pursuant to 401 KAR 51:017, any future significant modification proposed at this source shall be subject to the requirements of this rule.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

In accordance with 401 KAR 52:020, Section 6, the maximum operating time for the emergency generator shall not exceed 500 hours in any consecutive twelve (12) –month period.

**MONITORING AND TESTING:**

Pursuant to 401 KAR 52:020, Section 10, 401 KAR 61:015, Section 6, 401 KAR 61:005, Section 3, 401 KAR 59:160 and 190, 40 CFR 60, 40 CFR 75, and 40 CFR 96, the installed continuous emission monitoring systems shall continue to be calibrated, maintained, and operated for measuring the opacity of emissions, sulfur dioxide emissions, nitrogen oxides emissions and either oxygen or carbon dioxide emissions. The owner or operator shall ensure the continuous emission monitoring systems are in compliance with, and the owner or operator shall comply with the requirements of 401 KAR 61:005, Section 3.

(The permittee shall submit a schedule within six months from the date of issuance of this permit to conduct testing within one year following the issuance of this permit to establish the correlation between opacity and particulate emissions for Boiler Nos. 1 and 2. This testing shall be conducted in accordance with 401 KAR 50:045, Performance Tests, and pursuant to 40 CFR 64.4(c)(1), the testing shall be conducted under conditions representative of maximum emissions potential under anticipated operating conditions at the pollutant-specific emissions unit.

If no additional stack tests are performed pursuant to the specific monitoring requirements found in Section B of the permit for Boiler Nos. 1 and 2, the permittee shall conduct a performance test for particulate emissions by the start of the fourth year of this permit to demonstrate compliance with the applicable standard.

The permittee shall determine the opacity of emissions from the Boiler Nos. 1 and 2 stacks by EPA Reference Method 9 weekly, or more frequently if requested by the Division.

**OPERATIONAL FLEXIBILITY:**

The permittee has not proposed any alternate operating scenarios for any of the emissions units.

**CREDIBLE EVIDENCE:**

This permit contains provisions, which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.

**PAST PERMIT SUMMARY:**

<b>Permit Type</b>	<b>Issuance Date</b>	<b>Expiration Date</b>	<b>Summary of Action</b>
V-97-044 (Title V)	11/12/1999	11/12/2004	Initial Title V w/ Acid Rain Permit
A-98-012 (Acid Rain Permit)	03/05/1999 (Effective 01/01/2000)	12/31/2004	Final Phase II Acid Rain Permit
V-05-082 (Title V Renewal Permit w/ Acid Rain Permit and NOx Budget Permit)	TBD	TBD	Title V Renewal Permit w/ Acid Rain Permit and NOx Budget Permits